REMEDIAL ACTION REPORT

JOSEPH SIMON & SONS SITE
1605 Taylor Way, Tacoma, WA

June 2000

K/J 986054.00

Prepared for:

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(Ecology, 1998) and Cleanup Action Plan (CAP) established by the Washington Department of Ecology (Ecology). This report was prepared in accordance with the Agreed Order, the CAP, and the applicable requirements of the Model Toxic Control Act (MTCA) Cleanup Regulation, Washington Administrative Code (WAC) section 173-340.

In general, the RA was performed in accordance with the *Engineering Design Report* (EDR) (Kennedy/Jenks Consultants 1998a) and the *Intertidal Sediment Cleanup Action Plan* (IS-CAP) (Kennedy/Jenks Consultants 1998c).

1.1 Site Location

The site is approximately 5.9 acres in size; both the site and and surrounding areas are zoned industrial (refer to Figure 1). The site is located within an area of Tacoma designated by the United States Environmental Protection Agency (EPA) as the Commencement Bay Nearshore/Tideflats (CBN/T) Superfund site.

The site has formerly been used for several industrial purposes, including boat building, bulk petroleum storage, rail equipment storage, and as a log sorting yard. The site is bounded on the east by Nordlund Boat Company and a vacant CENEX facility, on the south by Taylor Way and a railroad right-of-way, on the west by a stormwater retention pond and drainage ditch for the McMillan Piper Warehouse, and on the north by the Hylebos Waterway (see Figure 1). The site is currently vacant and slopes slightly toward the Hylebos Waterway, to a drainage swale located near northern property boundary.

Compensation, and Liability Act (CERCLA). In 1993, EPA also issued Special Notice Letters with regard to the Hylebos Waterway. Simon & Sons received both General Notice and Special Notice Letters for the 1601 Taylor Way site.

EPA has identified several problem chemicals of concern in the Hylebos Waterway including arsenic, copper, lead, mercury, zinc, polynuclear aromatic hydrocarbons (PAHs), phthalates, and polychlorinated biphenyls (PCBs).

In April and May 1991, Ecology's Urban Bay Action Team (UBAT) collected samples of surface water runoff, sediment, and upland soil during a reconnaissance inspection of the site. Chemical analysis of these samples indicated that several metals (primarily arsenic, copper, lead, and zinc) were detected in surface water and sediment at levels of concern to Ecology.

In a letter dated 8 April 1993, Ecology summarized the results of sampling performed at the site and requested that Simon & Sons conduct a more detailed site investigation to evaluate the distribution of chemicals detected in site soil. In response to Ecology's letter, a Work Plan, outlining investigative activities that would be performed by Simon & Sons to address Ecology's concerns, was submitted to Ecology for review and comment. The results of the investigation are summarized in Kennedy/Jenks Consultants' *Preliminary Site Assessment Report* (PSA) dated July 1994.

Prompted by these results, Ecology, in their letter dated 25 August 1994, instructed that Simon & Sons conduct an RI/FS at the site. In a draft report titled *Focused Remedial Investigation and Feasibility Study* dated April 1996, Simon & Sons summarized the results of a remedial investigation and feasibility study performed at the site.

The results of the RI/FS and prior investigations indicated that the site had a long history of industrial use. Between 1946 and 1975, the site was used for boat building and repair. In the 1950s and 1960s, two 12,500-gallon aboveground storage tanks (ASTs) stored

construction business. In the fall of 1996, log sorting activities were discontinued at the site. The RI/FS also delineated the distribution of petroleum impacted soil

Based on the RI/FS results, Ecology selected a cleanup action to mitigate exposure of contaminated site media to human and biological receptors. The selected remedial action was outlined in Ecology's Agreed Order and CAP (Ecology 1998). In accordance with the Agreed Order, Simon & Sons prepared the EDR (Kennedy/Jenks Consultants 1998a) which outlined the specific elements of the remedial action.

Simon & Sons also completed investigation of the intertidal sediments in the Hylebos Waterway, adjacent to their property. The results of the sediment sampling activities were summarized in a report titled *Focused Intertidal Sediment Sampling* dated 15 July 1998. Based on the results of the sediment sampling, Simon & Sons prepared the IS-CAP (Kennedy/Jenks Consultants 1998c), which outlined their approach for remediation of the intertidal areas. Ecology's Agreed Order was amended to include intertidal sediment cleanup activities identified in the IS-CAP.

1.3 RA Achievements

In general, the Simon & Sons RA involved the following work:

- Excavated and disposed of contaminated soil that exceeded MTCA industrial soil cleanup levels for upland soils. MTCA industrial cleanup levels for contaminants of concern are listed in Table 1.

- Excavated and disposed of contaminated soil that exceeded the EPA CBN/T Sediment Quality Objectives (SQOs) for sediments located below Ordinary High Water and other upland areas as required by Ecology. The SQOs applied to soil excavated from shoreline and intertidal areas, and to a mound located along the eastern property boundary. In addition, the SQO for bis(2-ethylhexy)phthalate

- Installed an infiltration basin at the upper end of the drainage swale to filter stormwater runoff before it is discharged to the Hylebos Waterway.

- Backfilled, graded, and resurfaced the site as described in the EDR and IS-CAP. In general, the site was graded to direct surface water runoff to the infiltration basin, and to control run-on from adjacent sites.

- Reconstructed bank and intertidal areas as described in the EDR and IS-CAP. Modifications to the original plans for east and west bank areas, excluding the drainage swale area, were approved by Ecology prior to implementation.

- Cleaned up and disposed of refuse and debris from upland and intertidal areas.

- Currently implementing institutional controls to prohibit residential development at the site and prevent alterations to the site grade and infiltration basin.

Post-RA activities planned for the Simon & Sons site include:

- Sampling of surface water runoff from the infiltration basin and groundwater seeps, if any.

- Routine inspection and maintenance of the infiltration basin and site surface.

1.4 Report Organization

The remainder of this RA report includes the following sections:

- Section 2.0 presents an overview of RA activities at the site.

- Section 3.0 describes conditions encountered during excavation activities.

- Section 4.0 describes backfilling and other site restoration activities.

- Section 5.0 provides a summary of the RA, including conclusions.
- Section 6.0 lists references cited in this report.

This report also includes the following appendices:

- Appendix A contains tabulated analytical results for performance samples collected during the project.
- Appendix B contains copies of analytical reports and chain-of-custody documents for performance monitoring soil samples.
- Appendix C contains analytical reports and chain-of-custody documents for excavation water samples.
- Appendix D contains analytical reports and chain-of-custody documents for imported fill materials.
- Appendix E contains copies of compaction testing reports.
- Appendix F contains a copy of the final site survey performed by EarthTech of Federal Way, Washington.

this RA is provided in Table 2.

2.1 Excavation Areas and Procedures

The anticipated excavation areas designated in the EDR and IS-CAP were assigned unique designations (e.g., A1, B2, etc.) to facilitate communication between different parties involved in the cleanup effort, and to provide a numbering scheme for performance monitoring samples. Excavation areas and designations are shown on Figure 2, and are as follows:

- Intertidal Areas — A1, A2, A3, D2
- Surface Petroleum-Affected Areas — B1, B2
- Subsurface Petroleum-Affected Areas — C1, C2, C3, C4
- Shoreline Metals- and PCB-Affected Areas — D3, D4, D5
- Metals- and PCB-Affected Soil Pile — D1

Locations of previous soil samples with respect to the excavation areas described above are depicted on Figure 3.

2.2 Performance Monitoring Soil Sampling

Performance monitoring samples were typically collected immediately after excavation and field screening assessment of an area. Field screening included visual and olfactory observation of soil samples from the excavation areas, in addition to water-sheen testing and organic vapor headspace screening in petroleum-affected areas.

Over excavation was performed when cleanup standards were not met in the initial performance monitoring samples. Initial and over excavation activities are discussed in the following sections of this report and summarized in Tables 3 and 4, respectively.

four sections) and a bottom sample was collected from the center of each section. A minimum of one sidewall sample was also collected adjacent to each floor section. In some excavation areas located on the sloped bank areas, sidewalls were not present on the water-ward portion of the area, and floor samples at the excavation margin were collected in place of sidewall samples. A minimum of one bottom sample and three sidewall samples were collected from each excavation area. Performance monitoring sample locations are depicted on Figures 4-A and 4-B.

Performance monitoring sample names include an area designation, sample number, and sample depth. The sample number includes a letter designation of "S" for sidewall samples, an "F" or "B" for floor or bottom samples, respectively, and a sequential number. For example, sample A3-S4-3 represents the sidewall sample collected at location S4 from excavation area A3 at a depth of 3 feet below grade. At sample locations where the initial performance sample indicated analyte concentrations exceeded the established cleanup levels, over excavation was performed. The sample designation for areas where over excavation was performed are followed by the term "R" and a sequential number (e.g., A3-S5-R1-3). All over excavation samples refer back to the original sample location where the cleanup level exceedance was detected.

Analytical results for all soil performance monitoring samples are tabulated in Appendix A.

2.3 Laboratory Analyses

Laboratory analyses were performed by Spectra Laboratories, Inc. (Spectra) of Tacoma, Washington. Analyses performed included:

- Total arsenic, lead, copper and zinc by EPA Method 6010
- Total mercury by EPA Method 7471 Cold Vapor
- Polychlorinated biphenyls (PCBs) by EPA Method 8082

- BEP by EPA Method 8270
- Benzene, toluene, ethylbenzene, and xylene (BTEX) by EPA Method 8260.
- Gasoline, diesel, and heavy-oil range petroleum hydrocarbons by Washington State Department of Ecology approved methods NWTPH-G and NWTPH-D (extended).

2.4 Cleanup Standards

Cleanup standards for the RA include MTCA Method A industrial soil cleanup levels and EPA CBN/T SQOs. Cleanup standards were applied to specific areas of the site as follows:

- SQOs were applied to soils located within 10 feet of the top of the bank of the Hylebos Waterway to a depth of 5 feet bgs. This included excavation areas D3, D4, and D5, which were located on the banks of the Hylebos Waterway. In addition, SQOs were applied to the soil pile located in excavation area D1 and soils across the site for BEP.
- SQOs were applied to all intertidal areas located below Ordinary High Water elevation (approximately 12 feet above mean sea level and below). This included excavation areas A1, A2, A3 and D2.
- MTCA Method A industrial soil cleanup levels were applied to soils located in upland areas for metal and petroleum analytes. This included excavation areas B1, B2, C1, C2, C3, and C4.

Cleanup standards for the site are listed in Table 1, and areas to which specific cleanup standards are applied are illustrated on Figure 2.

2.5 Soil and Miscellaneous Debris Disposal

Disposal of soil and miscellaneous waste debris, including wood, metal, and concrete from the Simon & Sons site was performed by Regional Disposal Company (Rabanco) of Seattle, Washington. All waste materials were transported by rail to Rabanco's disposal facility located in Roosevelt, Washington. Additional waste material present onsite was disposed of or recycled as follows:

- Wooden timbers excavated from areas A-2 and D-4 were salvaged by Strider.
- Railroad ties were salvaged by Strider; ties that were not salvaged were disposed of at Rabanco.

During the RA, approximately 29,000 tons of sediment was removed from the site for offsite disposal. A summary of the estimated volume of material removed from each area is included in Table 3.

3 REMEDIAL ACTION ACTIVITIES

This section summarizes the specific remedial action activities conducted at the site. Soil sample locations and excavation areas are shown on Figure 4-A and 4-B.

3.1 Pre-remedial Action Activities

Pre-excavation activities performed from 2 to 6 August 1999 included:

- Mobilized to the site and installed job trailers at the south end of the site.
- Removed existing remnants of a former rail spur and installed a new temporary rail spur for soil transport by railcar. The rails were removed following completion of excavation activities. Rail installation and removal were performed by Rabanco.
- Demolished and disposed of the former office building located at the south end of the site.
- Installed a silt curtain and oil-absorbent boom in the Hylebos Waterway around the intertidal excavation areas. Following completion of the RA, the silt curtain and boom were removed at disposed of at Rabanco's disposal facility.
- Surveyed the anticipated excavation areas and site boundaries. Surveyed locations were based on the EDR and IS-CAP. Surveying was performed by EarthTech, Inc. of Federal Way, Washington.

3.2 Intertidal Area Excavation

This section describes RA activities in the intertidal areas, as designated in the IS-CAP and includes areas A1, A2, A3, and D2 (refer to Figure 2).

Soil was excavated from intertidal areas during low tide (dry) conditions. Excavation areas were isolated from the Hylebos Waterway by the silt curtain and absorbent boom. Soil excavated from intertidal areas was transported by truck to upland sections of the site that were not yet excavated. The soil was dewatered in the upland areas for a minimum of three days and subsequently loaded into rail cars for offsite disposal.

performed, are summarized in Table 4. The following conditions were encountered and activities were performed in the intertidal areas in addition to soil excavation:

- Area A-1 included a group of wood pilings that previously supported a dock. Approximately half of the pilings were removed intact; the remainder were broken with an excavator bucket at a minimum of 4 inches below grade. Pilings that were located outside of the excavation area were left in place.

- A buried rail line was discovered in area A-2. Two rows of heavy wooden timbers apparently used as a base for the rails extended from the southern to the northern edge of the area. Metal rails were attached to the timbers in the northern half of the area. The timbers were removed from the excavation in the southern half of area A-2. In the northern half of A-2, the metal rails and timbers were left in place because of their depth of burial and because their removal was not necessary to achieve SQOs in the bottom of the excavation.

- Several wood pilings were removed from area A-3. The pilings appeared to be associated with a dock structure located on the adjoining property to the west.

- The south part of area D-2 was located on a bank area that was covered with concrete blocks. The blocks were removed prior to excavation of soil from the area.

- Concrete, wood, metal, and cable debris was removed from the surface in the intertidal areas, including areas where other excavation was not performed. Concrete blocks that extended to depths of more than 1 to 2 feet below grade were left in place to maintain the stability of the existing slope.

3.3 Metals- and PCB-Affected Area Excavation

This section describes RA activities in the metals- and PCB- affected areas described in the EDR. The metals and PCB-affected area excavations included D1, D3, D4 and D5.

Areas D3, D4, and D5 were located adjacent to the Hylebos Waterway and extended partially into the upper intertidal zone. Therefore, these areas were excavated during low tide while the silt curtain and absorbent boom were installed.

SQO cleanup levels were applied to these for all non-petroleum contaminants. MTCA Method A industrial soil cleanup levels are applied to petroleum hydrocarbon compounds (gasoline, diesel, oil, and BTEX) in these areas. Excavation areas, depths, approximate soil volumes removed, and performance monitoring samples collected are summarized in Table 3. Over excavation activities, where performed, are summarized in Table 4. The following conditions were encountered and activities were performed during soil excavation activities:

- Concrete blocks that were present on the bank in excavation area D-3 were removed prior to soil excavation.
- Sandblast grit was identified during excavation of area D-4. Discontinuous layers up to several inches in thickness were present in the bank area west of the drainage swale. The layers of pure sandblast grit were contained within approximately 250 cubic yards of soil. Sandblast grit was not identified in other sections of area D-4.
- Concrete, wood, metal, and cable debris were removed from area D-5 prior to soil excavation. Approximately 10 wood pilings were removed from the excavation area.

3.4 Petroleum-Affected Area Excavation

This section describes RA activities in the surface and subsurface petroleum-affected areas (refer to Figure 2). These areas include upland areas B1 and B2 (surface soils) and areas C1, C2, C3, and C4 (subsurface soils). Cleanup levels applied to these areas included MTCA Method A industrial soil cleanup levels for all contaminants except BEP, for which SQOs are applied. Excavation areas, depths, approximate soil volumes removed, and performance monitoring samples collected are summarized in Table 3. Over excavation activities, where performed, are summarized in Table 4.

A large box (12 feet long, 9 feet wide, and 7 feet high) constructed of welded 3/8-inch steel was discovered in area C-3. The top was open, and the bottom consisted of a 2-foot-thick poured concrete slab reinforced with metal ribbon material. Petroleum-affected soil and wood debris were present in the box. The box was removed from the excavation, demolished and disposed of offsite.

3.4.1 Excavation Water Samples

Three water samples were collected from water that accumulated in excavations C-1 and C-2. Two samples were collected from excavation C-1, and one sample was collected from excavation C-2. These water samples were analyzed for petroleum hydrocarbons and BTEX. Neither petroleum hydrocarbons nor BTEX were detected in any of the samples at concentrations above the laboratory detection limits. Analytical results for water samples are tabulated in Appendix A; laboratory reports and chain-of-custody documents are provided in Appendix C.

in the EBR.

Materials used as fill included:

- Imported pit-run material in upland and shoreline areas
- Washed sand (No. 4 x No. 8) in intertidal and shoreline areas
- Crushed Surface Base Coarse (CSBC) material in upland areas.

Specific backfill materials were analyzed for chemicals of concern prior to use on the site. The analytical results were compared to SQO cleanup standards prior to use. Analytical tests included the following:

- Pit-run material was tested for petroleum and metals.
- Washed sand was tested for petroleum, metals, BEP, and PCBs.
- Topsoil was tested for petroleum, metals, and PCBs.

Cleanup standards were met in all imported material samples, except for one topsoil sample in which oil-range TPH was detected at 210 mg/kg, above the cleanup standard of 200 mg/kg. Reanalysis of the sample using a silica-gel extraction cleanup procedure resulted in an oil-range TPH concentration 190 mg/kg. TPH concentrations were below detectable levels in a second topsoil sample submitted for confirmation purposes. Analytical reports for imported fill materials are provided in Appendix D.

4.1 Upland Areas

Upland area excavations were typically backfilled following receipt of final performance monitoring sampling results. Pit-run was placed in 1-foot lifts and compacted with a vibratory roller. Excavation areas C-1 and C-2 were dewatered prior to placement of backfill material. The excavation water was pumped onto stockpiled soil that was to be transported offsite for disposal. Soil underlying the stockpiles was excavated after the stockpiles were removed.

placed into excavated areas using an excavator bucket where practicable, or was pushed into place using a dozer. The sand was initially placed at an elevation slightly above original grade to allow for natural compaction by tidal action. Where pilings were partially removed, backfill material was placed a minimum of 4 inches above the tops of the remaining piling sections.

4.3 Shoreline Bank Areas

Shoreline banks along the Hylebos waterway required reconstruction in areas where excavation had been performed. Ecology approved modifications to the EDR specifications for bank areas that required reconstruction prior to implementation. The locations of bank areas before and after the RA are depicted on Figure 3.

4.3.1 Drainage Swale Area

In areas around the perimeter of the drainage swale (excavation area D-4), banks were constructed of washed sand that was placed in an approximately 2-foot-thick layer above pit-run material. The final slope of the banks around the drainage swale was approximately 1.5 (horizontal) to 1 (vertical), extending from the top of the bank to the margin of the intertidal area. The banks were reconstructed as nearly as possible to the original bank locations prior to excavation activities. The infiltration basin (refer to section 4.4) formed the bank at the southern end of the drainage swale.

4.3.2 East Bank Area

The east bank included excavation area D-3 and the southern part of area D-2. The bank was initially constructed with washed sand at a slope of approximately 1.5 (horizontal) to 1 (vertical). Significant erosion of the sand material occurred on the water side of the bank areas, particularly at the eastern end of the shoreline. The intertidal zone fill material adjacent to the bank areas (Area A-1 and the northern part of Area D-2) was not eroded and appeared to be compacted by tidal action as anticipated.

To control erosion occurring in the eastern bank area, rip rap (composed of angular 2-foot minus quarry rock) was placed on the bank above an elevation of 6 feet above mean sea level (msl), and extended to approximately 17 feet msl. Fish rock was placed over the rip rap between the toe and the high water elevation (approximately 13 feet msl). The fish rock consisted of coarse river-cobble type fish rock that was used to fill in between the rip rap blocks. A finer pebble-sized fish rock that was placed on top of the coarse material.

4.3.3 West Bank Area

The shoreline area in the western part of the site (primarily excavation area D-5) was constructed of washed sand placed over a pit-run base. The slope of the bank above an elevation of 13 feet msl was approximately 1.5 (horizontal) to 1 (vertical). The slope was approximately 3 (horizontal) to 1 (vertical) between the elevations of 13 and 0 feet msl. Fish rock (as described above) was placed below an elevation of 14 feet msl to reinforce the slope against erosion. Approximately 6 inches of coarse river-cobble type fish rock was placed over the washed sand slope, and an additional 2 to 3 inches of pebble-sized fish rock was placed over the cobbles. The fish rock extended from area D5 to the edge of area A2.

4.4 Infiltration Basin Construction

An infiltration basin was constructed at the south end of the drainage swale within excavation area D4 to filter stormwater discharging from the site. The basin was constructed in a 180-degree arc with an inner radius of approximately 29 feet and an outer radius of approximately 45 feet, centered at the southern end of the drainage swale. The basin was constructed as follows:

- A berm with a height of approximately 7.5 feet, a width of approximately 24 feet, and a centerline radius of approximately 29 feet was placed in a 180-degree arc around the southern margin of the drainage swale. The northern face (inner arc) of the berm was oriented towards the drainage swale. The berm was constructed of 2-inch x 8-inch angular quarry rock placed at a centerline height of approximately 6 feet. Approximately 1.5 feet of ¾-inch x 1 ¼ -inch rounded gravel was placed above the quarry rock. The quarry rock and gravel were placed at a slope of

upwards from the toe at a slope of 1.5 (horizontal) to 1.0 (vertical) so that a V-shaped basin was formed behind the berm structure.

- Sand (No. 4 x No. 8) was placed in the basin behind (south of) the berm to an elevation of approximately 16 feet msl. Sand was also placed in the drainage swale to an elevation of approximately 12 feet msl on the northern side of the berm.

- Approximately 3 inches of rounded gravel (3/4" x 1 ¼ ") was placed above the infiltration basin sand.

The location of the infiltration basin is shown on Figure 5. Construction details of the infiltration basin are provided on Figure 6.

4.5 Compaction Testing

Compaction testing was performed by Professional Service Industries, Inc. (PSI) in upland areas following placement of pit-run material. Testing was performed only on the uppermost lift. The performance standard of 90 percent specified in the EDR was met for all test locations. Compaction testing reports are provided in Appendix E.

4.6 Vegetated Buffers

As part of the remedial action, Simon & Sons constructed a vegetated buffer along the western property boundary and along the shoreline areas. The vegetated buffers are intended to enhance wildlife habitat along the western property boundary adjacent to an existing creek and along the shoreline areas (refer to Figure 5). The vegetated buffers extended approximately 25 feet east from the western property boundary and south from the top of bank along the Hylebos Waterway. In all, approximately 22,000 square feet property (0.5 acres) were set aside habitat enhancement.

Vegetated buffers included installation of 1-foot of topsoil, planting of indigenous shrubs and trees (willow, pacific crab apple, and alder trees) and hydroseeding disturbed areas

with native grasses. On either side of the drainage swale, two buffer areas (approximately 50 long by 25 feet wide) were established where trees were planted at approximately 5 feet apart. In other vegetated buffer areas tree were planted on approximately 15-foot centers.

4.7 Post-Excavation Activities and Additional Site Work

Additional activities that were performed at the Simon & Sons site included:

- Installed a 6-foot high chain-link fence around the perimeter of the property, excluding the sections adjacent to the Hylebos Waterway. Two gates were installed along Taylor Way to facilitate access to the site.
- Performed a final elevation survey of the site. The final survey, which was performed by EarthTech, included site topography, property boundary locations, fence locations, landscaped area locations, infiltration basin location, and rip rap locations. The final survey map is provided in Appendix F.

direct surface runoff to the infiltration basin, and resurfacing the entire site surface with crushed rock. Other site restoration activities included construction of vegetated buffer areas along the western property boundary and along the Hylebos Waterway and installation of a perimeter fence.

As a result of the remedial action, approximately 29,000 tons of impacted soil was removed from the site and transported offsite for disposal at the Roosevelt disposal facility.

Site cleanup standards, including EPA Commencement Bay Nearshore/Tideflats SQOs and Department of Ecology MTCA Industrial Soil Cleanup Levels, were achieved throughout the site at each performance sampling location.

As a result of the RA, no further remedial action appears warranted. Future activities at the site will include surface water and seep monitoring to assess the concentrations of chemicals discharging from the site. In addition, inspection and repair of the site surface and infiltration basin will be completed on a semi-annual basis to evaluate the effectiveness of the RA.

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Tables

TABLE 1

SITE CLEANUP STANDARDS

Joseph Simon & Sons, Tacoma, Washington
986054.00

Chemical	MTCA Method A Industrial Soil Cleanup Level (mg/kg)	EPA CBN/T Sediment Quality Objective (SQO) (mg/kg)	Groundwater (mg/l)[a]
Arsenic	200	57	(b)
Copper	(c)	390	(b)
Lead	1,000	450	(b)
Mercury	1	0.59	(b)
Zinc	(c)	410	(b)
PCB	(c)	0.30	(b)
Bis(2-ethylhexyl) phthalate	9,370	1.3	(b)
Total Petroleum Hydrocarbons (Gasoline)	100	100	1.0
Total Petroleum Hydrocarbons (Diesel)	200	200	10
Total Petroleum Hydrocarbons (Other)	200	200	10
Benzene	0.5	0.5	0.071
Toluene	40	40	200
Ethylbenzene	20	20	29
Xylenes	20	20	20

Notes:

(a) Where appropriate standards are available, groundwater standards are set for protection of surface water due to the site's proximity to the Hylebos Waterway [per WAC 173-340-720(1)(c)]. Standards for TPH-Diesel and TPH-Other are based on Ecology Model NPDES Permit for surface water discharges from Leaking Underground Storage Tank cleanup sites. Standards for benzene, toluene, and ethylbenzene are based on the EPA "National Toxics Rule" surface water quality criteria for human health protection. The xylene and TPH-Gasoline standards are based on the Model Toxics Control Act groundwater cleanup levels, WAC 173-340-720, because no surface water quality standards are available for those constituents.

(d) Based on seep data and groundwater data from test pits, metals in groundwater were determined not to be a pathway of contamination to Hylebos Waterway. No groundwater cleanup standards have been set for PCB or bis(2-ethylhexyl)phthalate because test pit information indicates that these contaminants are not prevalent in the subsurface.

(c) Copper, zinc, and PCBs were evaluated and determined not to be present in upland soils at concentrations exceeding MTCA Method A standards for industrial soils.

Week of 4 August 1999	• Removed existing rail line • Installed new rail line • Demolished existing building • Installed silt curtain in Hylebos Waterway • Mobilized job trailers and equipment to site
Week of 9 August 1999	• Excavated soil in intertidal and shoreline areas A-1, A-2, A-3, D-2, D-3, and D-5 • Collected confirmation soil samples in areas A-1, A-2, A-3, D-2, D-3, and D-5 • Backfilled areas A-1, D-2, and D-3 • Installed oil-absorbent boom in the Hylebos Waterway in front of the silt curtain • Removed pilings from areas A-1, A-3, and D-5
Week of 16 August 1999	• Excavated soil in areas A-2, B-1, C-1, D-1, and D-5 • Backfilled intertidal areas A-1 and A-2 • Collected confirmation soil samples in areas A-2, B-1, C-1, D-1, and D-5 • Set grade stakes in northeast part of site • Backfilled with pit-run on northeast part of site (Phase I area)
Week of 23 August 1999	• Excavated soil in areas A-3, B-1, B-2, C-1, C-2, and D-5 • Backfilled areas A-1 and A-2 • Collected confirmation soil samples in areas A-3, B-1, B-2, C-1, C-2, and D-5 • Installed riprap and toe rock on bank areas in D-2 and D-3, and placed fine-grained fish mix over riprap
Week of 30 August 1999	• Excavated soil in areas B-1, B-2, C-1, and C-2 • Backfilled areas B-1, C-1, and D-1 • Backfilled northeast Phase I area to grade and placed crushed rock surface • Collected confirmation soil samples in areas B-1, B-2, C-1, and C-2 • Collected excavation water sample in C-2 • Performed as-built survey in Phase I area
Week of 6 September 1999	• Excavated soil in areas B-1, B-2, C-1, and C-3 • Backfilled areas B-2, C-1, and C-2 • Collected confirmation soil samples in areas B-1, B-2, C-1 and C-3 • Collected excavation water sample in C-1 • Removed debris from surface in intertidal areas

Dates	Activities Performed
Week of 13 September 1999	• Excavated soil in areas C-1, C-4, and D-4 • Backfilled areas B-1, D-5, and C-4 • Collected confirmation soil samples in areas C-1, C-4, and D-4 • Stockpiled sand for backfilling west bank and intertidal areas
Week of 20 September 1999	• Excavated soil in areas C-1 and D-4 • Discussed backfilling options for the western bank and intertidal areas with Ecology and Fisheries • Collected confirmation soil samples in areas C-1 and D-4 • Collected excavation water samples from area C-1 • Excavated infiltration basin area • Removed northern section of rail spur • Backfilled western bank and intertidal areas with washed sand overlain by fish rock
Week of 27 September 1999	• Excavated soil in areas B-2 and C-1 • Backfilled area D-4 • Collected confirmation soil samples in areas B-2 and C-1 • Constructed infiltration basin in area D-4 • Set grade stakes on western upland areas • Removed existing perimeter fence • Placed fish mix over riprap blocks on east bank area
Week of 4 October 1999	• Completed soil excavation • Collected confirmation soil samples from areas B-1 and B-2 • Backfilled upland areas with pit-run • Backfilled bank areas and drainage swale around D-4 with sand • Placed topsoil in a 1-foot layer on the western site boundary
11 October 1999 through 31 October 1999	• Completed backfilling in upland areas • Placed crushed rock surface in upland areas • Placed topsoil on shoreline and bank areas • Hydroseeded topsoil areas • Installed new perimeter fence with two gates • Planted trees and shrubs in topsoil areas • Performed final as-built survey

TABLE 3

SUMMARY OF INITIAL EXCAVATION AREAS
Joseph Simon Sons, Tacoma, Washington
986054.00

Area	Area Consistent with EDR and IS-CAP Estimates?	Depth of Excavation (feet below grade)	Estimated Volume Excavated (cubic yards)[a]	Performance Monitoring Samples Co		
				Sidewalls	Bottom	
Intertidal Excavation Areas						
A-1	Yes; located east of the central drainage swale	3 to 4 feet; existing grade sloped to the north toward the Hylebos Waterway	168	5	4	
A-2	Yes; located in the central drainage swale	3 to 7 feet; existing grade sloped to the north toward the Hylebos Waterway	1,420	10	8	
A-3	Yes; located at the western end of the shoreline	4 to 5 feet; existing grade sloped to the north toward the Hylebos Waterway	192	5	2	
D-2	Yes; located at the eastern end of the shoreline, adjacent to the CENEX dock	2 to 4 feet; existing grade sloped to the north toward the Hylebos Waterway	107	4	4	
Metals- and PCB- Affected Areas						
D-1	Yes; area included the soil pile along the eastern property boundary	Excavation included the soil pile plus 2 to 4 feet below the soil pile	1,144	8	3	
D-3	Yes; located on the eastern shoreline area	6 feet below top-of-bank grade	279	3	3	
D-4	Yes, although part of the western sidewall extended farther west than anticipated; located around the perimeter of the central drainage swale	3 to 7 feet; the original grade sloped toward the drainage swale around the inner perimeter of the area	2,107	14[d]	9	
D-5	Yes; located on the eastern shoreline area	4 to 7 feet below original top-of-bank grade	606	6	4	
Surface Petroleum-Affected Areas						
B-1	No; area is smaller than anticipated because of encroachment of adjacent subsurface petroleum-affected areas	2 to 3 feet below grade	1,034	8	5	
B-2	Yes; the overall areal extent is as anticipated, with some variation in specific areas adjacent to subsurface petroleum-affected areas	2 to 3 feet below grade	5,110	16	25	
Subsurface Petroleum-Affected Areas						
C-1	No; the area extended northward farther than anticipated	3 to 7 feet below grade	6,326	23	17	
C-2	Yes; the overall areal extent of subsurface petroleum is as anticipated if area C-4 is included, but is not continuous	5 to 7 feet below grade	1,105	7	3	
C-3	Yes, but deeper than anticipated	9 feet below grade	215	4	1	
C-4	Yes; this area is located within the anticipated subsurface petroleum contamination area	5 feet below grade	88	4	1	

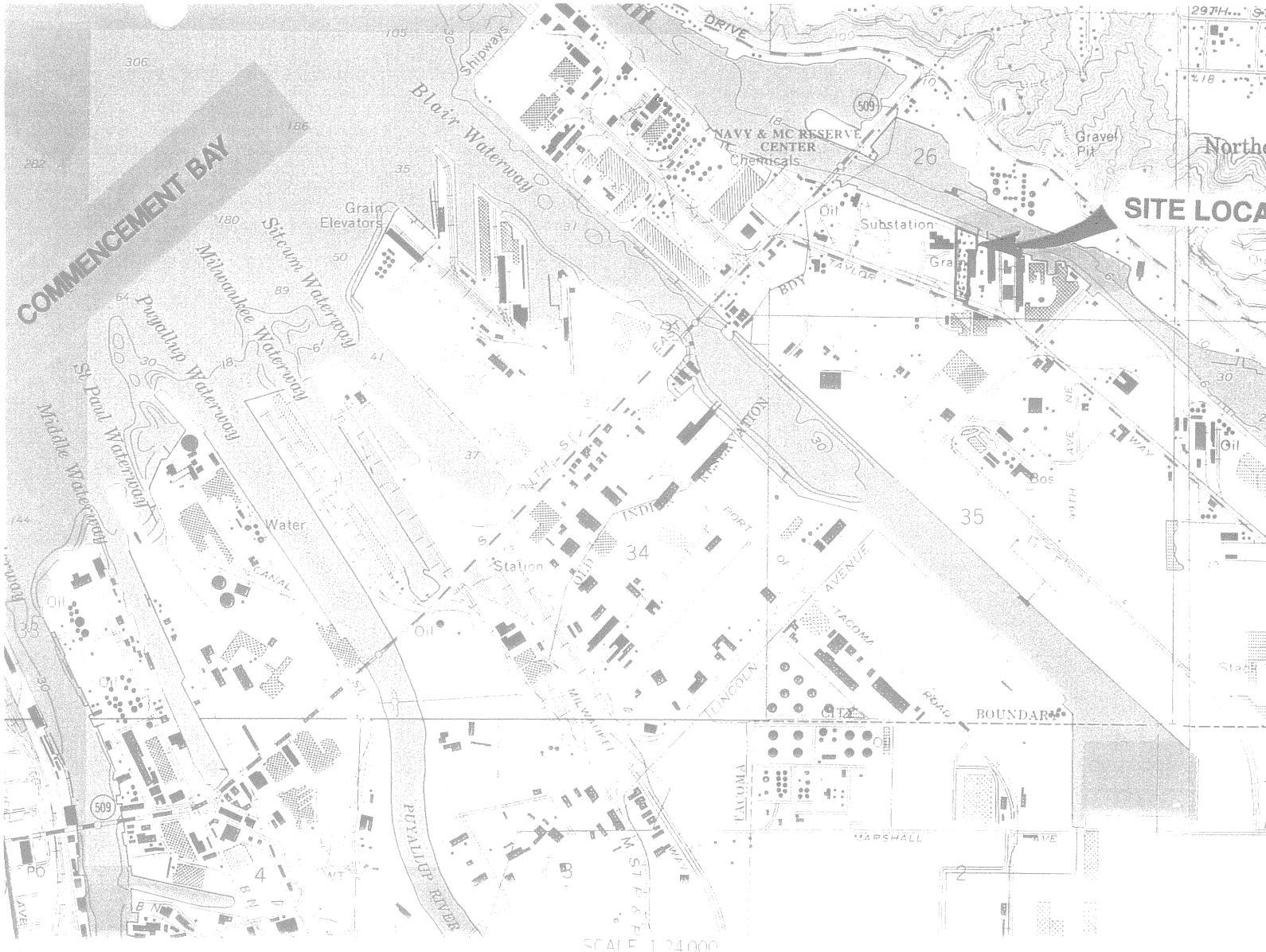
Notes:
a) Total estimated volume of excavated sediment is 19,901 cubic yards.
b) Refer to Table 1 for applicable cleanup standards.
c) Refer to Table 4 for a summary of overexcavation activities for areas where cleanup levels were not met by initial confirmation samples.
d) Area D-4 was open to the drainage swale to the north, therefore "sidewall" samples were collected from the excavation floor where the margin of the exavation intersected t

			square foot area
Area A-3			
A3-S1-2; west sidewall	PCBs, 1.5 mg/kg	A3-S1-R1-3 A3-S1-R2-2	West sidewall overexcavated approximately 35 feet westward
Area B-1			
B1-S3-1; west sidewall	Heavy Oil, 480 mg/kg; BEP, 10.42 mg/kg	B1-S3-R1-1 B1-S2-R1B-1	West sidewall overexcavated westward by 2 feet ina 50-foot wide section
Area B-2[(b)]			
B2-F4-2; bottom	BEP, 13.6 mg/kg	B2-F4-R1-3	Excavation floor overexcavated by 1 foot
B2-F5-2; bottom	BEP, 1.58 mg/kg	B2-F5-R1-3 B2-F5-R2-3.5	Excavation floor overexcavated by 1 foot; BEP detected at 2.49 mg/kg; excavation floor overexcavated by an additional 0.5 foot
B2-F6-2; bottom	BEP, 1.3 mg/kg	B2-F6-R1-3	Excavation floor overexcavated by 1 foot; sample collected approximately 10 feet south of initial sample location because area C-2 subsequently incorporated the initial B-2 sample location
B2-F11-2, bottom	Diesel, 1200 mg/kg	C4-F1-5	Excavation floor subsequently overexcavated as part of area C-4
B2-F13-2; bottom	Heavy Oil, 460 mg/kg; BEP, 73.8 mg/kg	B2-F13-R1-3	Excavation floor overexcavated by 1 foot
B2-F15-2; bottom	BEP, 2.02 mg/kg	B2-F15-R1-3	Excavation floor overexcavated by 1 foot
B2-F17-2; bottom	BEP, 3.07 mg/kg	B2-F17-R1-3	Excavation floor overexcavated by 1 foot
B2-F18-2; bottom	Heavy Oil, 510 mg/kg	B2-F18-R1-3	Excavation floor overexcavated by 1 foot
B2-F19-2; bottom	Heavy Oil, 450 mg/kg	B2-F19-R1-3	Excavation floor overexcavated by 1 foot
B2-F20-2; bottom	Heavy Oil, 660 mg/kg	B2-F20-R1-3	Excavation floor overexcavated by 1 foot
B2-F21-2; bottom	Heavy Oil, 1400 mg/kg	B2-F21-R1-3	Excavation floor overexcavated by 1 foot
B2-F22-2; bottom	Heavy Oil, 460 mg/kg	B2-F22-R1-3	Excavation floor overexcavated by 1 foot
B2-S10-1; south sidewall	BEP, 1.51 mg/kg	B2-S10-R1-3	South sidewall excavated southward by 4 feet to a depth of 3 feet in a 50-foot wide section
B2-S11-1, south sidewall	Heavy Oil, 200 mg/kg	B2-S11-R1-2	South sidewall excavated southward by 4 feet to a depth of 2 feet in a 50-foot wide section
B2-S15-2, east sidewall	Mercury, 1.3 mg/kg	B2-S15-R1-2	East sidewall excavated eastward by 3 feet in a 50-foot wide section
Area D-1			
D1-S1-1, north sidewall	Mercury, 1.52 mg/kg; Lead, 6300 mg/kg; Zinc, 690 mg/kg	D1-S1-R1-1 D1-S1-R2-1 D1-S1-R3-1 D1-S1-R4-2	North sidewall overexcavated northward by 10 feet; mercury and zinc detected at 1.73 and 550 mg/kg, respectively, in sample D1-S1-R2-1; overexcavated an additional 20 feet northward and 10 feet westward from sample D1-S1-R2-1 location
D1-S2-1, north sidewall	Heavy Oil, 430 mg/kg; Zinc, 500 mg/kg	D1-S2-R1-1 D1-S2-R2-2	North sidewall overexcavated northward by 15 feet
D1-S4-1, west sidewall	Zinc, 500 mg/kg	D1-S4-R1-2	West sidewall overexcavated westward by 3 feet
Area D-4			
D4-S4-1, northern edge	Heavy Oil, 340 mg/kg; Arsenic, 120 mg/kg; Zinc, 470 mg/kg	D4-S4-R1-3	Excavation floor overexcavated by 2 feet in a 500 square foot area
D4-S10-2, northern edge	Mercury, 0.89 mg/kg	D4-S10-R1-3	Excavation floor overexcavated by 1 foot in a 500 square foot area
D4-S12-2, northern edge	Lead, 1000 mg/kg	D4-S12-R1-3	Excavation floor overexcavated by 1 foot in a 500 square foot area
Area D-5			
D5-S4-2, east sidewall	BEP, 1.65 mg/kg; Copper, 580 mg/kg	D5-S4-R1-2	East sidewall excavated eastward by 8 feet

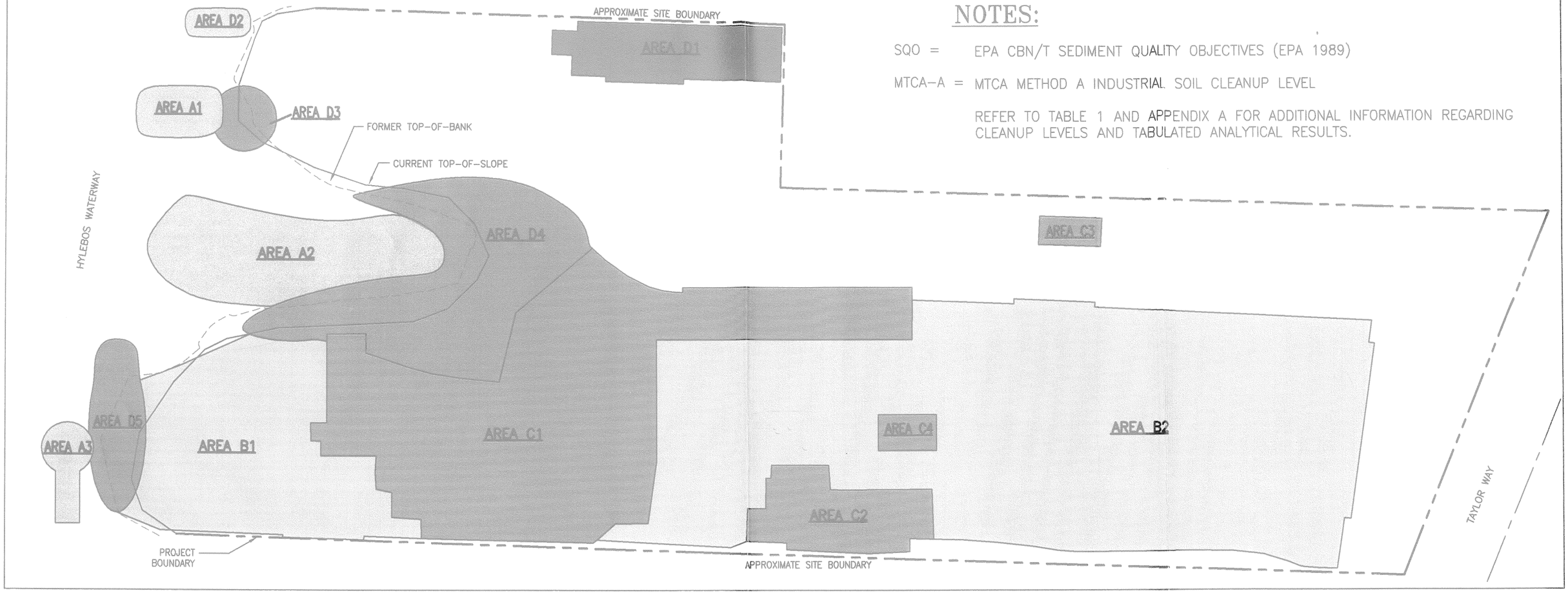
Notes:
(a) Refer to analytical results tabulated in Appendix A for specific analyte concentrations in final performance monitoring samples.
(b) Over-excavation surface areas for floor samples in area B-2 were 1,000 to 2,500 square feet.

Cleanup Levels were met at the completion of over-excavation activities in all excavation areas.

Figures



CONTOUR INTERVAL 20 FEET
DOTTED LINES REPRESENT 10 FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOWER LOW WATER
THE RELATIONSHIP BETWEEN THE TWO DATUMS IS VARIABLE
SHORELINE SHOWN REPRESENTS THE APPROXIMATE LINE OF MEAN HIGH WATER
THE MEAN RANGE OF TIDE IS APPROXIMATELY 8 FEET



NOTES:

SQO = EPA CBN/T SEDIMENT QUALITY OBJECTIVES (EPA 1989)

MTCA-A = MTCA METHOD A INDUSTRIAL SOIL CLEANUP LEVEL

REFER TO TABLE 1 AND APPENDIX A FOR ADDITIONAL INFORMATION REGARDING CLEANUP LEVELS AND TABULATED ANALYTICAL RESULTS.

LEGEND:

- INTERTIDAL AREAS
- SHORELINE METAL AND PCB AFFECTED AREAS
- METALS AND PCB AFFECTED SOIL PILE
- UPLAND SURFACE PETROLEUM AFFECTED AREAS
- UPLAND SUBSURFACE PETROLEUM AFFECTED AREAS

APPLICABLE SITE CLEANUP STANDARDS

ANALYTE	CLEANUP LEVEL (mg/Kg)	BASIS
PCB	0.30	SQO
BEP	1.3	SQO
As	57	SQO
Pb	450	SQO
Hg	0.59	SQO
Cu	390	SQO
Zn	410	SQO
APPLICABLE AREAS		
A1, A2, A3, D2		

ANALYTE	CLEANUP LEVEL (mg/Kg)	BASIS
BEP	1.3	SQO
As	200	MTCA-A
Pb	1000	MTCA-A
Hg	1	MTCA-A
TPH-gas	100	MTCA-A
TPH-diesel	200	MTCA-A
TPH-oil	200	MTCA-A
BENZENE	0.5	MTCA-A
ETHYLBENZENE	20	MTCA-A
TOLUENE	40	MTCA-A
XYLENES	20	MTCA-A
APPLICABLE AREAS		
B1, B2		
C1, C2, C3, C4		

ANALYTE	CLEANUP LEVEL (mg/Kg)	BASIS
PCB	0.30	SQO
BEP	1.3	SQO
As	57	SQO
Pb	450	SQO
Hg	0.59	SQO
Cu	390	SQO
Zn	410	SQO
TPH-gas	100	MTCA--A
TPH-diesel	200	MTCA--A
TPH-oil	200	MTCA--A
BENZENE	0.5	MTCA--A
ETHYLBENZENE	20	MTCA--A
TOLUENE	40	MTCA--A
XYLENES	20	MTCA--A
APPLICABLE AREAS		
D3, D4, D5		
D1		

N

0 40 80

SCALE: 1"=80'-0"

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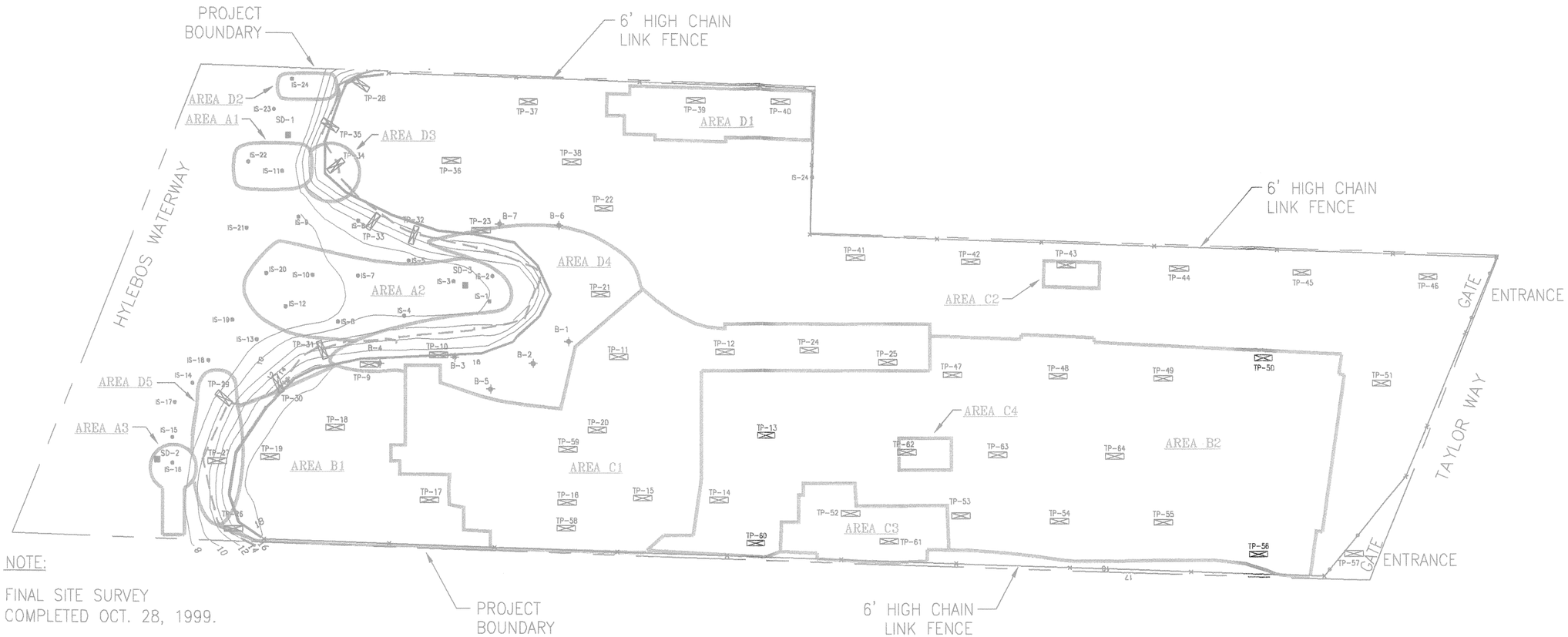
EXCAVATION AREAS AND APPLICABLE CLEANUP STANDARDS

986054.00/P8SK002E

FIGURE 2



NOTE:

FINAL SITE SURVEY
COMPLETED OCT. 28, 1999.

LEGEND

- CURRENT ELEVATION CONTOUR (FEET MSL)
- CURRENT EXCAVATION BOUNDARY
- FORMER TOP-OF-BANK LOCATION
- CURRENT TOP-OF-BANK LOCATION
- FORMER TEST PIT LOCATION & NUMBER
- FORMER SOIL BORING LOCATION & NUMBER
- FORMER INTERTIDAL SEDIMENT SAMPLING LOCATION & NUMBER

NOTE: ALL LOCATIONS ARE APPROXIMATE

N

0 40 80

APPROXIMATE SCALE IN FEET

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PREVIOUS SOIL SAMPLE LOCATION MAP

986054.00/P8SK005

FIGURE 3

AREA D2

AREA A1

AREA D3

APPROXIMATE SITE BOUNDARY

AREA D1

BLDG

CURRENT TOP OF SLOPE

HYLEBOS WATERWAY

AREA A2

AREA D4

AREA D5

AREA B1

AREA C1

AREA B2

AREA A3

PROJECT BOUNDARY

MATCH TO FIGURE 2-B

LEGEND

EXCAVATION LIMITS

C1-F16-3 — SAMPLE LOCATION – LAST NUMBER INDICATES SAMPLE DEPTH

NOTES:

1. LOCATIONS ARE APPROXIMATE
2. REMEDIAL ACTION PERFORMED FROM AUGUST 1999 TO OCTOBER 1999

N

0 20 40

SCALE: 1"=40'-0"

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CLEANUP ACTION PERFORMANCE MONITORING SAMPLE LOCATIONS

986054.00/P8SK002C

FIGURE 4-A

LEGEND

EXCAVATION LIMITS

C1-F16-3 — SAMPLE LOCATION – LAST NUMBER INDICATES SAMPLE DEPTH

MATCH TO FIGURE 2-A

AREA C1

C1-S20-2 C1-S22-2 C1-F17-4 C1-S21-3 C1-S23-3

AREA C3

C3-S3-4 C3-B1-9 C3-S2-4 C3-S4-4 C3-S1-4

AREA C4

C4-S1-3 C4-S2-3 B2-F11-2 C4-S4-3 C4-F1-5 C4-S3-3

AREA C2

C2-S4-5 C2-S7-5 C2-S6-5 C2-S5-5 C2-S3-5 C2-F1-7 C2-F2-7 B2-F6-2 C2-F3-7 B2-F6-R1-3 B2-S6-1 B2-S5-1 C2-S2-5 C2-S1-5

AREA B2

B2-S15-R1-2 B2-S16-2 B2-S15-2 B2-S14-2 B2-S13-2 B2-S12-2 B2-F23-3 B2-F17-2 B2-F17-R1-3 B2-F18-2 B2-F18-R1-3 B2-F19-2 B2-F19-R1-3 B2-F20-2 B2-F21-R1-3 B2-F21-2 B2-F20-R1-3 B2-F22-2 B2-F22-R1-3 B2-S11-1 B2-S11-R1-2 B2-F9-2 B2-F10-2 B2-F12-2 B2-F13-R1-3 B2-F13-2 B2-F14-2 B2-F15-F1-3 B2-F15-2 B2-F16-2 B2-S10-R1-3 B2-S10-1 B2-F5-R2-3.5 B2-F5-R1-3 B2-F5-2 B2-F4-R1-3 B2-F4-2 B2-F3-2 B2-F2-2 B2-F1-2 B2-S4-1 B2-S3-1 B2-F2-1 B2-S1-1 B2-S9-1

APPROXIMATE SITE BOUNDARY

TAYLOR WAY

NOTES:

1. LOCATIONS ARE APPROXIMATE
2. REMEDIAL ACTION PERFORMED FROM AUGUST 1999 TO OCTOBER 1999

N

0 20 40

SCALE: 1"=40'-0"

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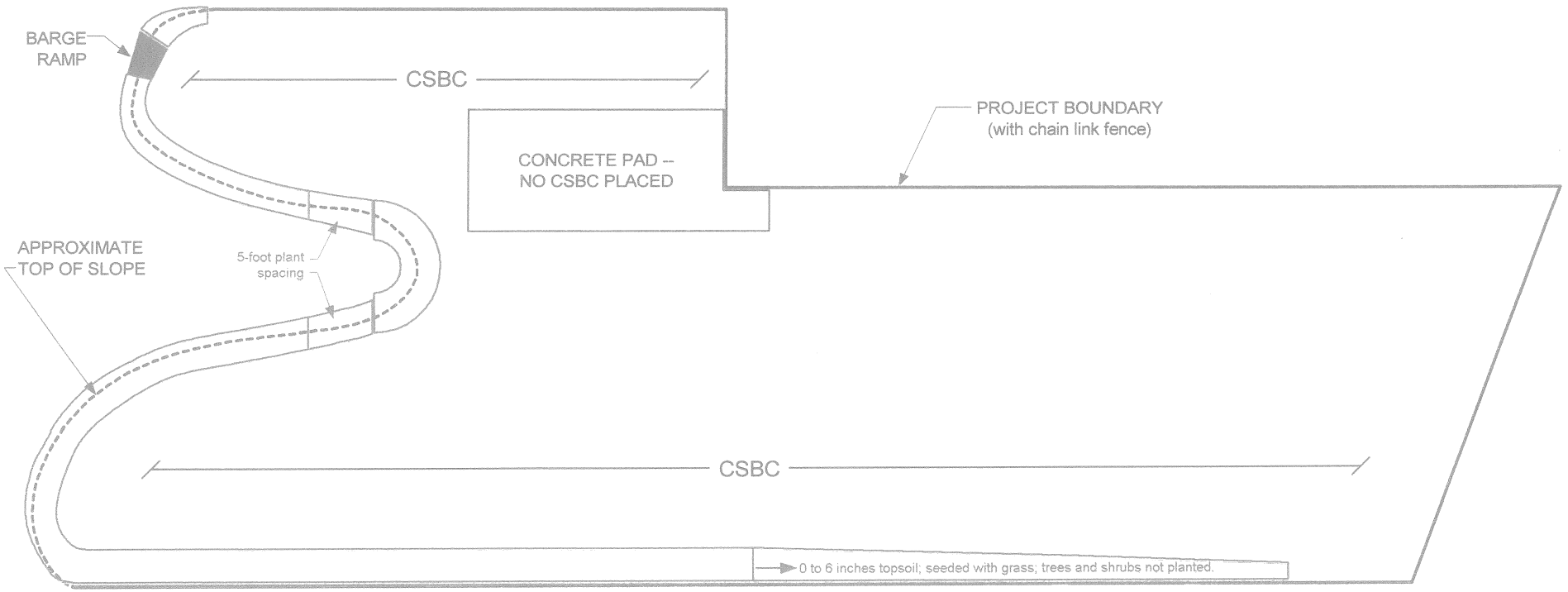
CLEANUP ACTION PERFORMANCE MONITORING SAMPLE LOCATIONS

986054.00/P8SK002D

FIGURE 4-B



LEGEND:

CSBC 3-inches Crushed Surface Base Coarse material

Vegetated Buffer Area -- Topsoil placed in 1-foot lift, hydroseeded with native grasses, and planted with trees and shrubs at 15-foot centers unless otherwise indicated

Infiltration basin location. Outline includes berm area and infiltration sand area

N

0 100 200

Approximate Scale in Feet

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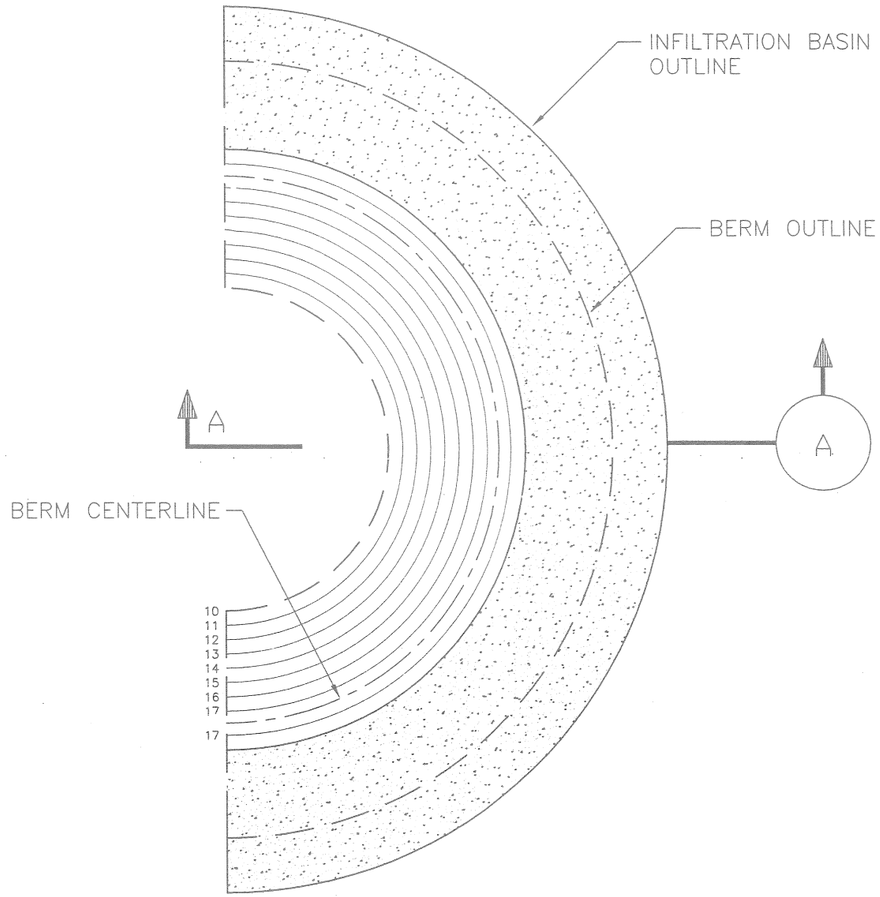
TACOMA, WASHINGTON

LANDSCAPE MAP

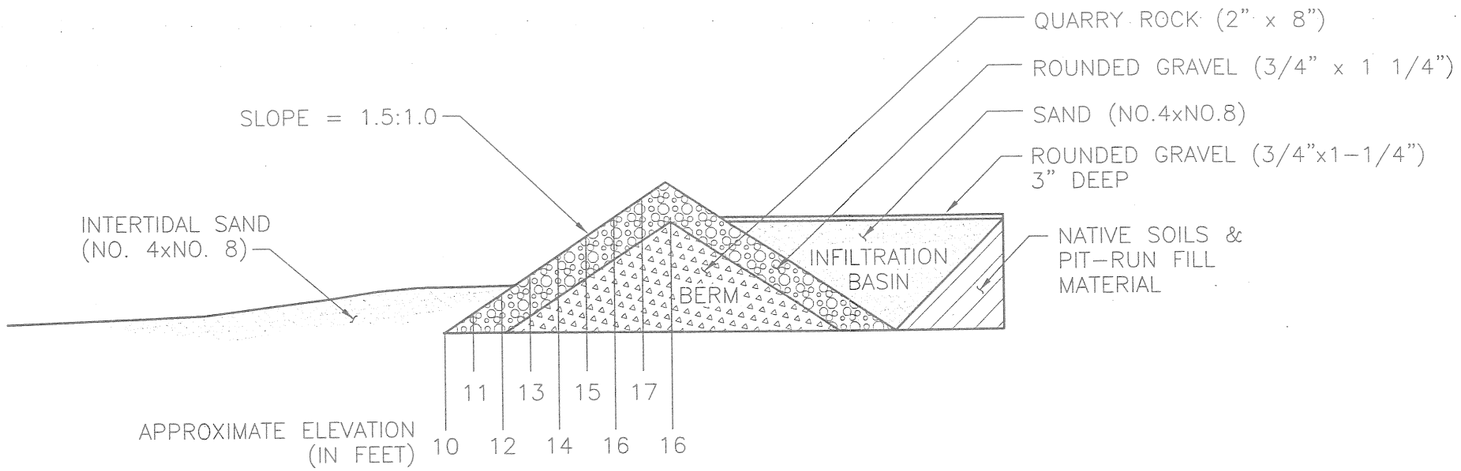
986054.00/LANDSCAPE.VSD

FIGURE 5



PLAN
SCALE: 1/16"=1'-0"

10 ~ APPROXIMATE ELEVATION IN FEET



SECTION
SCALE: 1/8"=1'-0"
A

0 4 8
APPROX IN FEET

0 8 16
APPROX IN FEET

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TACOMA, WA

INFILTRATION BASIN PLAN

986054.00/P0SK007

FIGURE 6